Sectt. II-27—40,000—16-10-52.

(193) Department.

SERIES.

G.O. No. 2737

DATED 8-12-1936

[Despatch Abstract.]

C.F. 30.

DEPARTMENT.

Received [illegible] *Registered* Dev. 4733 1/19
22.11.37

Subject.

Demonstration of sugar manufacture by the open-pan process
Application of Dr.R.Nagan Gowda Hospet for the loan of departmental machinery and plant free of hire, etc. charges.

ENCLOSURES.
No. nil
Spare copies

No. 871-B/37.

Station Madras *Dated the* 18th November 1937

From (Name) L.B.Green Esq., M.B.E.,
(Designation) Director of Industries,

To The Secretary to the Government of Madras,,
Development Department

Sir,

Dr.R.Nagan Gowda, Hospet, Bellary District, has requested that this department should arrange to stage at Hospet a demonstration of the manufacture of white sugar from sugar cane juice by the open pan cum centrifugal process in as thorough a manner as possible so that the ryots of the area may familiarise themselves with the process and be able to carry on the work themselves later. I enclose a copy of Dr.Nagan Gowda's letter. Sub-Committee No.III of the Sub-Committee of the Provincial Economic Council for Agricultural Development considered that the falling off in the production of Khandsari sugar in Northern India went to show that the open-pan method of sugar manufacture

is uneconomic as compared with vacuum pan manufacture. It is the case, however, that the experiments carried out by the department some years ago at Singanallur and Hospet were inconclusive and that the experience of the Bombay Agricultural Department goes to show that it is more profitable to manufacture sugar by the open pan process than to prepare jaggery. I consider therefore that, in view of the exceptionally low prices ruling for jaggery, it would be well worth while to stage an experimental demonstration in the Hospet area, which appears to be a very suitable venue, in order to determine with more exactitude the economics of the open-pan system of sugar manufacture. On the other hand it is not likely that the demonstration would be viewed with favour by the India Sugars and Refineries Ltd,.

2. It will be seen from Dr.Nagan Gowda's letter that the ryots of the area are willing to supply the requisite quantity of cane for the demonstration. If the Government view the request favourably, I suggest that the necessary machinery and juice boiling pans be lent free of hire charges and also the services of a mechanic and a driver free of cost, provided that the ryots agree to bear the cost of transport of the machinery bothways, to supply the requisite cane, labour, fuel and lubricating oil etc. and to meet all other expenditure in connection with the demonstration.

3. An approximate estimate of the expenditure that would have to be met by the ryots is given below. The two sugar cane mills with engines attached to the Bezwada division have been already requisitioned for the ensuing season, as already reported in my letter No.985-B/37 dated 21st October 1937 to Government in connexion with a similar demonstration to be conducted for the Cooperative Society at Dimli, Vizagapatam district. It will therefore be necessary to send an engine and mill from one of the other divisions to Hospet. In order to keep down the cost, an ordinary jaggery boiling furnace with two pans may perhaps be employed for the demonstration, instead of a furnace with five or more pans usually recommended for open pan boiling.

On the above basis the estimated expenditure will be as follows:

		Rs.
I.	Capital - Non-recurring:	
i.	Transport charges on plant and machinery both ways ...	200.
ii.	Cost of construction of furnace	50.
iii.	Cost of putting up two thatched sheds, one for engine and machinery and one for the furnace	75.
iv.	Cost of ladles, filters etc.	25.
v.	Cost of empty tins for storing rab, molasses etc. ...	20.
vi.	Cost of gunnies for storing sugar	10.
vii.	Miscellaneous charges, sugar, drying platform etc.	20.
		400.

II.	Recurring - Daily working expenses.			
	Cost of two drums crude oil for engine for 10 hours work ...	3	8	0
ii.	Lubricating oil, kerosine, waste and sundries ...	1	8	0
iii.	Sajji, soda and other chemicals	0	4	0
iv.	Wages of coolies for feeding canes, carrying juice to pans, firing furnace, boiling rab, drying bagasse, mixing rab, centrifuging, drying sugar etc., eight coolies at Rs.0-6-0 ...	3	0	0
v.	Miscellaneous	0	12	0
	Rs.	9	0	0

4. The hire charges that the department will be called upon to forego by lending the machinery free of charge will, for the whole season, extending roughly to four months, amount to Rs.480 at Rs.120/ per month (Rs.100 for sugar cane mill and engine, Rs.15 for the centrifugal, Rs.5 for a set of two pans).

5. As the cane crushing season is fast approaching, I request that very early orders may issue in the matter.

Director of Industries.

Copy of letter from Dr.R.Nagan Gowda, M.Sc., Ph.D., to the Director of Industries, Madras.

Sub: Open pan sugar plant for Hospet.

I wish to thank you on behalf of the deputationists that waited on you at Kudatini on the 24th inst. to request you to conduct experimental demonstration in sugar making by open pan sugar plant at Hospet this season, for the kind hearing you gave them and the willingness you expressed to give a favourable consideration to the request.

As the deputationists explained to you the reasons for the above request are as follows:

(1) The price of jaggery has gone down tremendously and it does not pay to make jaggery from cane.

(2) The price offered by the factory namely Rs.7 per ton of cane delivered to the factory (which works out at Rs.6 and even less in the field) for Pundia cane is also too low to pay the cost of cultivation of cane.

(3) There is more cane in this area than can be taken care of by the factory and it is therefore necessary that some of the cane, more than 2,000 acres will have to be crushed and made into jaggery. This will be the case even in future years for there is no alternative crop in this area and the ryot by habit plants cane.

(4) Open pan sugar making is profitably worked in a number of places in the Bombay Presidency during the last two seasons, ever since the price of jaggery fell down below Rs.12 per palla of 250 lbs. (The price in Hospet now is Rs.6 to Rs.7 per heru which comes to about 247 lbs).

(5) It has been shown according to Bulletin No.175 of 1934 of Bombay Department of Agriculture and a recent report by Mr.V.V. Gadgil of the Bombay Department of Agriculture making sugar by open pan process is more profitable than making jaggery.

(6) Open pan plant never had a good and continuous trial in this Presidency and not even a decent demonstration in Hospet of

what your department tried at Singanallur in 1932. The demonstration that was tried at Hospet in 1932-33 involved the ryot who undertook it in considerable loss, without even producing a pound of decent sugar.

(7) There are many problems connected with the open pan plant that are still to be worked out and therefore a plant should be put up by the Government and experiments conducted in as thorough a manner as possible so that in coming years the same could be copied by other ryots not only here but in other parts of the country as well.

(8) The plant should be located in Hospet for here we are willing to supply you all the cane you will require for a good trial for 4 months from December to March. | 5

(9) The plant should be of a size that would be commercially economical to produce sugar on; the size worked out by Mr.Gadgil in the above bulletin being quite satisfactory. (The Brihn Maharastra Sugar Co. worked it successfully last year at Boregaon near Pandarpur in Sholapur district, Bombay Presidency).

(10) The season is fast approaching and therefore it is necessary that the work should be undertaken immediately. It should start work with the beginning of the season so that the recovery of sugar from the beginning to the end of the season may be studied.

6

Dcs

Ors 47331(1).37-1 dt 1-12-37

Ref letter from the Dy No 87/1-B-37 dt 18-11-37.

Demonstration Bellary Dt - Sugar manufacture by open pan process - Application of Nafar Chanda, Hospet for loan of departmental machines free of hire charges.

CF

Sec Govt accept the proposal of the Director of Industries for arranging (on the benefit of the Govt) to stage at Hospet a demonstration of the manufacture of white sugar from sugar cane juice by the open pan cum centrifugal process for a period not exceeding four months. The departmental machinery consisting of a sugar cane mill and engine, a centrifugal

p 1-CF

para 4 at p 3-CF

para 3 at p 2 CF

machine and a set of two pans will be sent to the ryots free of hire charge but subject to the conditions that the ryots agree to bear the cost of transport of the machinery both ways, to supply the requisite cane, labour and lubricating oil etc and to meet all other expenditure connected with the demonstration as detailed in the Director's letter read above. The services of a mechanic and a driver will also be sent free of cost.

2) The Director should submit a report to Govt on the results of the experiments and demonstration

The D-I

A.G. through the Fin Dept

Comptr Fin Dept

Dy. R. Nagam Gowda Hospet, anthay mistries

Carpetsheet

P.S. 1-12-37.

Jr 27.11.37

SO 27.11.37

Gr 29.11

CR 30.11.37

CF

Please see the D.'s letter
re the circumstances
reported by the Dist Inspnl
may be accepted.

~~A draft of the Secretary's~~
~~for approval if necessary~~
~~sent to the Dir Dept for~~
~~acceptance~~

Any hindrance machinery free
(57.11.3) of charges for the demonstration,
for a limited period from months
the Comm will have to forego charges
in the matter of Rs 480, being the
pay etc of the Mechanic and Driver
during the period of demonstration.

2. A draft is submitted for
approval & may be sent to the Finance
Secy for acceptance.

Para 1 & 2 CF.

Para 3 CF

27.11.57

27/11

9

There are 20 ryots there near from Hospet. They came to ask if Govt to fix minimum prices for Cane came to be paid by the Hospet Sugar factory. but prospects of Govt fixing prices are not bright The Sugar factory is working at a loss & so cannot afford to pay what the ryots would deem fair. On the other hand I am convinced that the ryots stand to lose materially if they cannot get at least cultivation cost. Hence their anxiety to start sugar manufacture on Khandsari system. Sugar Cane season begins on 15th Dec. The proposal I recommend may be sanctioned at once

Cld
30/11/37

Special

Finance u/o

4733-II-37-1
1-12-37

Finance (Accts)

Please see the remarks of Devt Secretary above and the draft memo order below.

17.37 Dy V

2. The estimate of expenditure which the ryots (of Hospet) will have to bear for transporting the plant etc. is Rs 400 and the daily

working expenses Rs 9/- Assuming that the plant will be used for a period of 100 days for demonstration in the period of 4 months: the total expenditure will be

Capital Rs 400

Recurring expenses (9×100) Rs 900

1,300

In view of this heavy expenditure which has to be borne by the ryots, this dept may agree that no recoveries need be made towards hire charges of plant (Rs 480 for 4 months) and pay of mechanic and driver.

3 The draft memo may be accepted

Cf. para 4 on p 3 CF

(This dept agreed to free demonstration in the case of Dimili Co-operative Society and Vizagapatam DI for similar reasons — papers not readily available)

Cf. para 4 on p 3 CF

Fri no 37337 dtd 8/12/37

To Undertaking. The drafts may send reasons

MADRAS SECRETARIAT TO GOVERNMENT
1 DEC 1937
DEVELOPMENT DEPARTMENT

The papers may be recorded for future reference

M2 R.T.O

4. //

A draft order is submitted for approval

6.12.57

6.12.57

5/9/12 12

DRAFT FOR APPROVAL.

C.F. 16.

Dep. Depts

	Date.	Initials.
When received for fair copying		
When copied		
When examined		
When signed		
When despatched.		

SUBJECT:— Memoms —

Experiment and demonstration - Sugar manufacture by open pan process - Demonstration at Hospet, Bellary Dt - Application of Dr. Nagan Gowda - Loan of departmental machinery and plant - freight charges — sanctioned

READ AGAIN _____, dated _____ 19____.

" " _____ " _____ 19____.

READ *ALSO*:—

No. 4733 A/37 from the A.D.I, No. 8T/B/37, dated 18.11.1937. pp 1-3 CF

" _____ " _____ " _____ " _____ 19____.

" _____ " _____ " _____ " _____ 19____.

~~Order~~ ~~Resolution~~ ~~Ms.~~ ~~Rout.~~ No. 2737, dated 8-12- 1937

Recorded

The Dept

6.12.37

Ag. 7/12

6.12.37

13

C.F. 30.

INDUSTRIES **DEPARTMENT**.

ASSISTANT SECRETARY TO GOVERNMENT 32 JUL 1938 DEVELOPMENT DEPARTMENT

Received ..... 19 *Registered* 19100 D 19

Subject.

Demonstration Bellary District - Sugar manufacture by open pan process

Records Switch at two of the attached pay work

ENCLOSURES.
No. Copy
Report
Spare copies

No. 871-B/37

Station Madras, *Dated the* 12th July 1938

From (Name) L. B. Green Esq., M.B.E.,
(Designation) Director of Industries.

To The Secretary to the Government of Madras,
DEVELOPMENT Department.

Sir,

Ref 6-7 of G.O 2737 Dev 8-12-37 at (E) Ref 3-11 infra

Reference:- Government Memorandum No.4733-II/37-1, dated 1st December 1937.

I enclose a copy of the report of the Assistant Industrial Engineer, Bezwada, on the demonstration conducted at Hospet. The demonstration commenced on 19th February 1938 and lasted until 11th April 1938. It will be seen from the report that owing to the favourable prices that prevailed in the market for jaggery, it was found more profitable to manufacture jaggery than white sugar. From the data of costs worked out at the end of the report, it will be observed that

Ref 8-11 ante

14

the profit on the purchase of canes at Rs.7-8-0 per ton and conversion of the juice into jaggery worked out to Rs.1-13-0 per ton of cane, while the profit in manufacturing white sugar and molasses jaggery amounted only to Rs.1-9-0 per ton.

2. The cane used for the demonstration appears to have been of an inferior variety and quality as the yield of rab worked out only to 12.2 per cent on the weight of cane, whereas with good varieties of cane from 18 to 20 per cent is the normal figure. It may, however, be concluded that the preparation of white sugar by the open pan process will not generally be more economic than the manufacture of jaggery, unless the price of sugar is abnormally high in relation to the price of jaggery.

Director of Industries.

VS/

WHITE SUGAR MANUFACTURE.

Demonstration at H o s p e t.

The demonstration of white sugar manufacture by open pan process was conducted at Hospet, Bellary District. The Department gave for the above demonstration one cane mill, of Chattanooga No. 145 of 3/4 tons capacity of canes per hour and for the Pundya Patch, one centrifugal machine of Messrs. Berry Brothers, one 12 to 14 B.H.P. Peter oil engine with other equipment such as countershaft, belting etc. All the above machinery was given free of hire. The services of the departmental staff such as a mechanic for the manufacture of sugar and a driver for the engine were given free. The work for the preparation of the rab was carried on for a period of 23 days. By this time the cane season was nearing its close. The party wanted to stop the work in the preparation of the rab with a view to consume the molasses of the rab already prepared into jaggery. His idea could not be carried out as he did not supply canes for the molasses to prepare into molasses jaggery. Unfortunately, Dr. Nagan Gowda, the party was not able to spare his full time due to his absence from Hospet owing to his activities elsewhere. Therefore, he entrusted this work to two other local people of Hospet. The above two persons did not take the needed interest in the demonstration work. There in the work site, the party started another type of Poona furnace of single pan type. He showed keen interest on this furnace. Whenever he used to come there, he did not show interest towards the work of the demonstration of the department.

Though Sindewhai double pan furnace was completed as per the blue print, it was not used as the party, after consultation with the Industrial Engineer, wanted a furnace of bigger pans. Accordingly, the Industrial Engineer designed

another type of multiple pan furnace which was constructed there.

The Furnace Designed by the Industrial Engineer.

The delay in finishing the construction work of the furnace was due to labour not supplied in time, and the pans and chimney not ~~having~~ being brought in time by the party even after the construction work was over. After the trial the front passage of the ash pit was partially closed, as suggested, the fire gratings were adjusted by raising them one foot. The furnace worked very satisfactorily. The striking pan of the furnace was changed, as it was found difficult to boil large quantities of juice. It was replaced by a flat bottomed pan of ~~2'-3"~~ 3'-3" top 2'-2" bottom diameters and 1'-3" height. The capacity of the furnace was such that juice out of two tons of canes was boiled in an average period of twelve hours nearly. This period varies according to the activity of the feeder and quality of the fuel.

Crushing of canes.

The total quantity of canes crushed for the preparation of rab to molasses jaggery was 71,137 lbs. The canes brought to the work site were Pundya variety. They were cut at the field and brought to the site by means of carts. The cane supplied was not of fresh quality. They had undergone certain amount of dryness at the work site as well as at the field. This resulted in effecting the quality as well as the quantity of the juice obtained. The extraction of juice calculated at intervals by taking 100 lbs of canes was found to be 66 to 70% on the weight of canes. There was variation due to the dryness that the canes had undergone in the fields. Weighing of canes was done early in the morning at about 4-0' ~~and~~ clock and the crushing was commenced for the rab preparation. The price per ton of canes as supplied for the rab preparation was Rs 7-8-0. The party had to purchase trash at the rate of one quarter anna per bundle for the furnace as he got cane stripped of the leaves.

Preparation of rab.

6551 lbs of rab was prepared out of 53,760 lbs of canes. For the preparation of the rab juice extracted from the canes was first poured into the pans and then the furnace was started. The scum rising from the surface of the juice was removed at 80 degrees centigrade by means of bamboo ladles. It was removed before the juice began to boil. After the scum was removed, it into a cloth strainer kept in a basket over the pan. Bendi juice was added in the pan. Well grown Bendi plant, after removing leaves was crushed with a wooden hammer and then it was rubbed well in a bucketful of water. This gave a thick viscous fluid which was found unsuitable to be added to the juice. Here for the demonstration work only one day the plan was supplied. The party was given information as soon as I arrived at Hospet, to supply Bendi plant every day for the demonstration work. Lists of materials required for the demonstration work were given to the party's agent, but they were not properly supplied. The labour supplied was very inefficient. This information was brought to the notice of the party very often but no improvement was done towards this. Under the circumstances explained above, the work was pushed through.

After removing the scum, Sajji which is an alkaline earth was dissolved in water and the solution was used to neutralise the acids in the juice. Throughout the period of boiling the scum that rises to the top was removed. When the juice was concentrated it became less in quantity. The required height was maintained by transferring juice from the other pans. The juice was concentrated until the strike temperature 110 to 112 centigrade was reached. This concentrated juice is called rab. At this temperature rab was immediately transferred into another vessel for airing. It was aired until its temperature fell to 90 degrees centigrade. After airing, the rab was stored in four gallon kerosene tins and kept for fifteen days nearly for the crystals to develop.

Centrifuging of Rab into sugar.

When the rab was kept about fifteen days sugar crystals developed. There was alo golden syrup known as molasses. To separate the crystals from the molasses rab was pugged in a pug mill supplied by the party and then it was fed to the centrifugal machine 35 to 40 lbs. per charge. The sugar in the cage of the centrifugal machine was given one to two washings with syringe full of water to drive away the traces of molasses. No washing of sugar was done with solutions of chemicals, as the party did not supply chemicals even though the required list of chemicals was given. Unable to secure a trained man for feeding the furnace as the party often changed coolies, this resulted in the quality of the sugars. With this inefficient labour supplied by the party and with only one chemical known as Sajji and with limited facilities given for the work by the party the work was pushed through and good sugars were obtained as far as possible. The samples of sugars obtained were submitted to the Industrial Engineer and to the Assistant Engineer.

Preparation of Rab as per the instructions of LeatherResearch Chemist.

In this method instead of Bendi juice and Sajji chemical Super phosphate and Hydrosulphite is used. Good lime in solution was mixed in cane juice until the red litmus turned blue. At this stage the juice was heated up to 80 to 90 degrees centigrade and then the solution of superphosphate was added until it was neutral to blue and red litmus. Next it was removed in four gallon kerosine tins for decanting and filtering the sediment. However carefully it was filtered and decanted a small quantity of sediment escaped. Further it took long period to boil very small quantities of juice into rab. After the sediment was removed a small quantity of Hydrosulphite in solution was added and at the same time the liquor was tested and kept neutral to blue and red litmus. The scum was removed as usual by means of strained and cloth. It was then boiled into rab by striking at 110 to 112 degrees centigrade. The sugars obtained were almost equal in colour to the sugars obtained by the first method.

Molasses Jaggery

The total quantity of molasses obtained from the rab was 4934 lbs. All the molasses were not converted into molasses jaggery as the party did not supply canes to convert all the molasses into jaggery. He first decided to arrange Poona furnace for the preparation of molasses jaggery and then he changed his idea. He then got another furnace constructed for molasses jaggery. The capacity of this furnace was 450 to 500 lbs of juice. For each boiling it took three to four hours. In a day three boilings were done. For each boiling 40 to 60 lbs of molasses were used. Therefore. 1128 lbs of molasses were boiled with cane juice out of 17,337 lbs of canes and 2,559 lbs of jaggery was obtained. For the rest of the molasses the party did not supply canes to utilise molasses for preparing jaggery. The party was informed repeatedly to get them prepared into jaggery but he left them. The average percentage of yields of rab, sugar and molasses jaggery are calculated on the total weight of canes. The working data is given on separate sheets:

At the demonstration work side the party had got 240 tons of canes nearly for the Poona furnace as well as departmental furnace for preparing molasses jaggery and rab. The total expenditure. income and loss for the entire work was approximately Rs 3,011, 2,307 and 704 respectively.

When the departmental demonstrations alone is considered the loss will be about Rs 122/8 or ~~Rs~~123/-. Here the capital cost of the pans, the iron ware, tins etc., are not taken into account. ~~These will serve for some time more~~ These will serve for some time more. The above loss could be minimised if the party had utilised all the molasses obtained from rab into jaggery.

70

WORKING DATA.

Note: The yield of rab sugar varies as the canes were cut in the field and brought to the work-site some time after they were cut. They were crushed the next morning. The canes were of Pundya Variety containing less percentage of sugar.

Total canes crushed for the rab preparation (Weighment on 9-3-1938 and 11-3-1938 were deducted).	53,760 lbs
Total rab obtained	6,551 lbs
Total sugar obtained	1,863 ,,
Total molasses	4,934

For the molasses jaggery.

Canes used for the molasses jaggery	17,377 lbs
Molasses mixed in the juice of the above canes	1,128 ,,
Molasses jaggery obtained	2,559 ,,

Percentage of yield of weight of canes.

Percentage of sugar on rab	28.4%
Percentage of sugar on canes	3.5%
Percentage of pure jaggery on canes	11 to 12 %
Percentage of rab on canes	12.1 or 12%
Percentage of molasses added to canes for molasses jaggery.	6.5%
Percentage of molasses obtained on canes (dilute molasses).	9.0%
Percentage of molasses jaggery on the canes	14.1%

Manufacturing costs.

I. For ordinary jaggery.

Cost price of 5 tons of canes at Rs 7-8-0 per ton	37-8-0
At 12% yield of jaggery on canes total amount of jaggery. 53½ maunds at Re.1/-	53-8-0

Working expenses.

Crude oil for crushing 5 tons of cane.	1-2-4
Lubricating oil	0-8-4
Kerosine oil	0-1-0
Trash	1-3-0
	2-14-8

9 21

Labour.

Three coolies at the cane-mill. Rs 2- 0- 0

Two near the pan.

Three carrying begasse

For the jaggery maker.

4- 0- 0 plus

Rs2-14- 8

or Total expenditure. Rs7-0-0.

Total cost of jaggery Rs 37-8-0
7-0-0

44-8-0 44-8-0

Profit.

Selling price of jaggery 53-8-0

Cost price. 44-8-0

9-0-0 or Rs 1-13-0 per ton of cane.

II. Sugar Manufacture.

Profit per ton of cane used solely for the preparation of rab.

Cost of two tons of canes at Rs 7-8-0 per ton	Rs 15	0	0
Sugar obtained on two tons of canes. 156.3 lbs or 1½ maunds at Rs 2-8-0 per maund.	15	10	0
Expenses.			
Crude oil	0	7	6
Lubricating oil-	0	3	4
Kerosine etc.,	0	3	0
Trash	0	7	6
Nine coolies	2	8	0
Centrifuging of rab while crushing canes and sometime after stopping crushing.	0	12	0
	4	9	10

Cost of sugar.

Cost of canes (2 tons)	15	0	0
Expenses	4	10	0
	19	10	0
Cost of sugar from one ton of canes $\frac{19\text{-}10\text{-}0}{2}$	9	13	0
Selling price of sugar from one ton of canes $\frac{15\text{-}10\text{-}0}{2}$	7	13	0
Selling price of molasses obtained from the above and made into jaggery as detailed below.	2	11	0
	10	8	0

Selling price of jaggery got out of three tons of cane and molasses got out of two tons of canes made into jaggery. Rs 37-8-0

Selling price that could be got if three tons of cane is made into pure jaggery. Rs 32-1-0

Extra amount realised by addition of molasses got from two tons of canes, made into jaggery

Rs 37-8-0 - 32-1-0 = Rs 5-7-0 on two tons or on one ton. Rs 2-11-0.

Total selling price of sugar and molasses per ton of canes.	10	8	0
Cost price of manufacture of sugar.	9	13	0
Profit per ton of canes converted into sugar	Rs 0	11	0

III. Sugar Manufacture.

Profit per ton of cane used both for the preparation of rab and molasses jaggery.

Cost price of 3 tons of canes. (The juice out of three tons of canes can be utilised in preparing molasses jaggery out of the molasses of two tons of canes.)	Rs 22	8, 0
Crushing cost.		
Crude oil	0	11 3
Lubricating oil	0	10 0
Kerosine etc.	0	2 0
Trash	0	11 0
Coolies. Two.	0	8 0
Jaggery maker	0	8 0
Total.	3	2 3

Total cost of molasses jaggery out of three tons of canes. 37.5 maunds or 940 lbs. @ one rupee per maund which varies according to the market rate. Rs 37/8/-.

Total expenses in preparing molasses jaggery.

Cost of 3 tons of canes	Rs 22-8-0
Working expenses.	3-2-3
	25-10-3

Therefore total cost in preparing sugar out of two tons of canes and molasses jaggery out of three tons of canes.

	25-10-3
	19-10-0
	45- 4-3

Price of sugar of two ~~two~~ tons of canes.	Rs 15-10-0
Molasses jaggery from three tons of canes.	37- 8-0
Total.	53- 2-0

Profit. Rs 7-13-9 or Rs 1-9-0 per ton of cane.

23

Dev. Dept

Subject: Demonstration - Bellary Dist
Sugar manufacture by open pan
process.

19100 II/38 From the D.D.,

C.F. No. 871-B/37, dated 12-7-38

To Under Secy.,

Please see the letter
from the D.D. and the enclosure
thereto at pp 1-11 C.P. May be Stitched
(E) with G.O. Ms. No. 2737 Dev. dated
8-12-37 after perusal.

SP 8/9
25/7 No. 7.38

28/7.38

Pl Date
29-7-38

H.M(Ind.)

Circ 30/7.

Circ
1-8-38